

... ..

[illegible]

MEDOVAR, B.I.; MAKARA, A.M.; ASNIS, A.Yu.

Effect of small titanium and aluminum additions on the structure and properties of seams in automatic welding. Dop.AN URSR no.4:41-49 '48.

(MLRA 9:9)

1.Institut elektrozvayuvannya imeni Ye.O.Patona Akademii nauk Ukrain's'koi RSR. Predstavleno diysnim chlenom AN URSR Ye.O.Patonom.

(Welding)

On the Nature of the Primary Crystallization of the Weld Metal Pool. A. M. Mekara and B. I. Medovar. (Avtogennoe Delo, 1948, No. 12, pp. 25-27). (In Russian). Some results of previous experiments on the crystallization of the fused metal in a weld, which showed that wave formation in the liquid could not explain the crystallization taking place in well-defined layers, are re-examined. Further experiments with a submerged arc, in which this form of crystallization was obtained, although wave formation was excluded, are described. Photomicrographs of the crystalline structure are given, and it is shown that aluminum greatly increases the stratification. Tamman's theory of crystallization is shown to be inapplicable to the conditions existing in the fused metal during welding, the crystallization being governed by the constancy of the product of the thickness of the crystallized layer and the speed of crystallization in the direction of the temperature gradient. M. K.

MAKAROV, A. M.

PA 160T22

USSR/Engineering - Bend Fatigue Tests May 50
Welds, Testing of

"Bending Testing of Welded Joints," A. M. Makarov, B. S. Kasatkin, Inst of Elec Welding imeni Acad Ye. O. Paton, Acad Sci Ukrainian SSR, 7½ pp

"Avtogen Delo" No 5

Describes experiments conducted by the Inst of Elec Welding in 1948-49. Concludes present standard OST7887 for bend testing of welded joints is unsatisfactory, and should be replaced by some more expedient method. Suggests bending test for specimens with longitudinally welded seam.

160T22

MAKARA, A.M., CHIRKINA, T.M.

Electric welding

Double arc, double layer welding of 10 mm thick metal. Avtom. svar., 4, No. 6, (21), 1951.

9. Monthly List of Russian Accessions, Library of Congress, _____ June _____ 1953, Uncl.
1952

MAKARA AM

✓ Properties of dissociation of supercooled austenite of steel type 30KhGS in the thermal cycle of the weld zone. A. M. Makara and Yu. D. Malyshev (Acad. Sci. Ukr. SSR). *Metall. Sverdlsk* 7, No. 8, 3-18 (1954).—Results of magnetic, x-ray, and metallographic studies of the dissociation of supercooled austenite in steel type 30KhGS under conditions of the thermal cycle of welding are presented. Temp. of austenitization has a definite effect on the kinetics of the dissociation of austenite during cooling. Increasing the duration of austenitization at significantly lower temps. (800-900°) causes a shift of the transition to lower temps. Products of martensitic transformation are formed during the thermal welding cycle as well as a significant amt. of residual austenite. The nature of its dissociation during welding depends chiefly upon the heterogeneity of the austenite.

J. R. Behrman

of D q

MAKARA, A.M.; GOPAL'SKIY, Yu.N.; GRABIN, V.F.

~~Investigation of the effect of the electric fusion welding process~~
Investigation of the effect of the electric fusion welding process
on the bead fusion and the width of the zone surrounding the bead
in connection with the problem of steel alloy welding. Avtom. svar.
8 no.2:11-25 Mr-Apr '55. (MLRA 8:7)

1. Orden Trudovogo Krasnogo Znameni Institut elektrosvarki imeni
Ye.O. Patona, Akademiya nauk USSR. (Steel alloys--Welding)
(Electric welding)

MAKARA, A.M.; GOTAL'SKIY, Yu.N.; NOVIKOV, I.V.

Hot cracking of welds in automatic seam welding with flux and their
relation to initial crystallization. Avtom.svar.8 no.4:3-11 J1-Ag'55
(MLRA 8:11)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni
Ye.O.Patona Akademii nauk USSR
(Electric welding)

AID P - 5250

Subject : USSR/Engineering

Card 1/2 Pub. 11 - 1/15

Authors : Makara, A. M., V. F. Grabin and I. V. Novikov (Electro-welding Institute im. Ye. O. Paton)

Title : Adjacent-to-seam cracks and mechanical properties of welded joints in resistance slag welding of medium-alloy steels.

Periodical : Avtom. svar., 4, 1-22, Ap 1956

Abstract : The authors analyze the cracks which occur in the area near seams of medium-alloy chrome-nickel-molybdenum steels, and the fissures which may appear near the line of fusion. Causes and methods of prevention are outlined and studied. Mechanical characteristics of the adjacent-to-seam areas and the metal of the seam-itself are ascertained. The triple-layer method of resistance slag welding was introduced. This method restores the toughness of metal in adjacent-to-seam areas without the

AID P - 5250

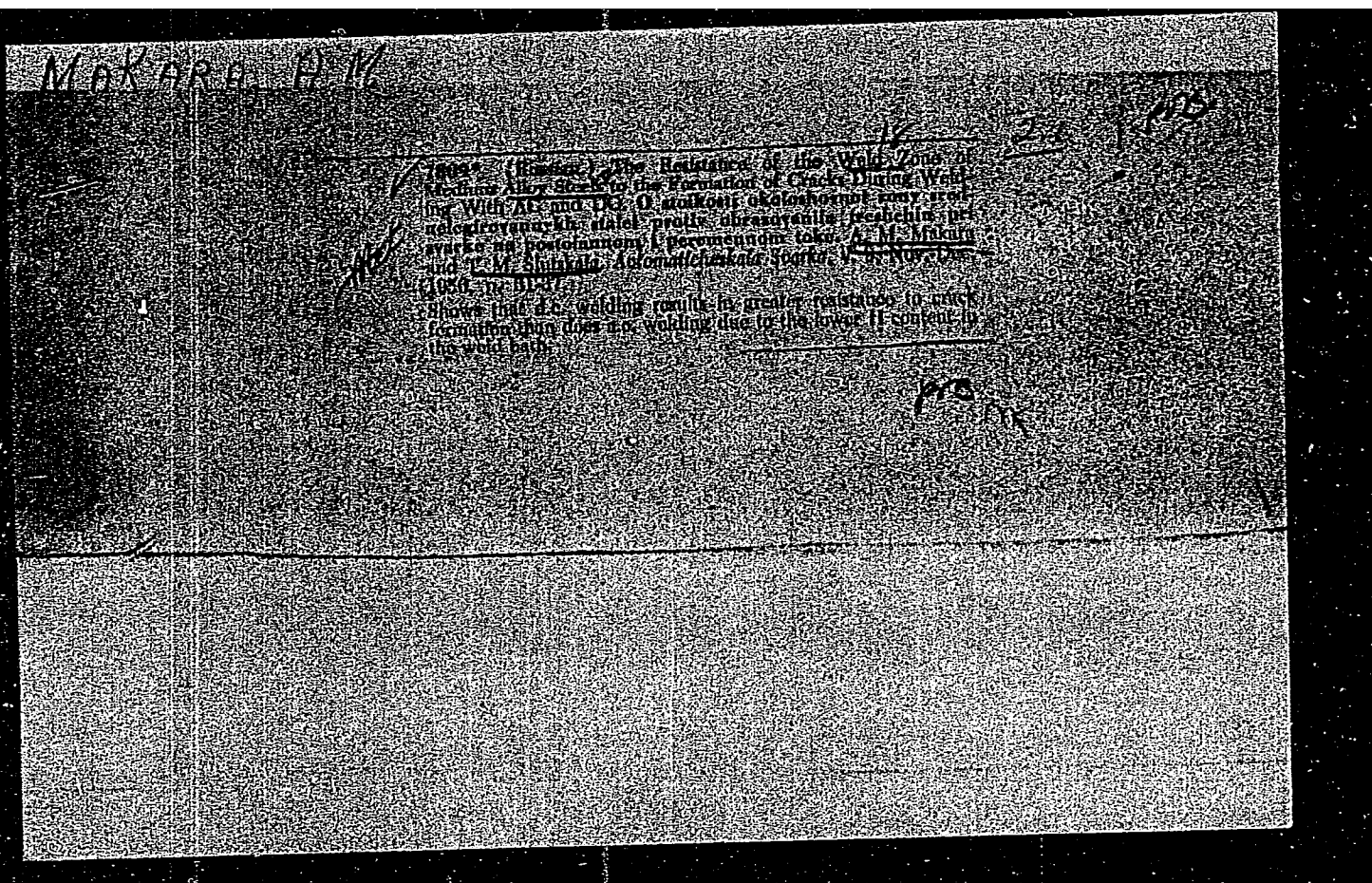
Avtom. svar., 4, 1-22, Ap 1956

Card 2/2 Pub. 11 - 1/15

need for heat-treatment of the specimen after welding. The method of double-layer hard-facing, used in conjunction with the triple-layer method restores the original features of the adjacent-to-seam area without tempering after welding. Nine macro- and microstructure-photos, 6 tables and drawing; Five Russian references (1955-56).

Institution : As above

Submitted : No date



MAKARA, A.M.; ROSSOSHINSKIY, A.A.

Chemical heterogeneity of the weld metal zone and crystallization planes and its connection with diffusion between solid and liquid phases during crystallization of the weld. Avtom.svar.9 no.6:65-76 N-D '56. (MLRA 10:3)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvariki im. Ye.,O.Patona AN USSR.
(Steel alloys--Welding)

W 128-58-11-7/16

AUTHORS: Makara, A.M., Lakomskiy, V.I., Zhovnitskiy, I.I.

TITLE: An Investigation on the Distribution of Hydrogen in Weld Joints of Medium Alloy Steels with Austenite and Ferrite Seams (Issledovaniye raspredeleniya vodoroda v svarnykh soyedineniyakh srednelegirovannykh staley s avstenitnym i ferritnym shvami)

PERIODICAL: Avtomaticheskaya svarka, 1968, No 11, pp 16-21

ABSTRACT: As contradictory opinions exist between data (Ref. 1,2) and the general opinion on hydrogen diffusion in metals, changes of hydrogen content in characteristic points of weld joints near the seam and near the base metal were investigated. Information is presented on methods to determine the hydrogen content in different zones of austenite and ferrite seams. Results of tests are compared with data obtained by computation. It was stated that in medium alloy steels, the hydrogen content increases sharply on the side adjacent to the seam, and in austenitic welds, on the side of the base metal. It is proved that the hydrogen content in zones adjacent to austenitic seams is higher than in zones of ferrite seams. The ob-

Card 1/2

WV/128-58-11-2/16

An Investigation on the Distribution of Hydrogen in Weld Joints of Medium Alloy Steels with Austenite and Ferrite Beams

tained results confirm the opinion that the subordinate part of hydrogen is a cause of crack formation near the weld joints (Ref. 10,2). Further investigations on factors affecting the resistance to crack formation to a larger extent than hydrogen does are needed.

There are 6 tables, 4 diagrams, 4 photos, 2 graphs and 10 references, 6 of which are Soviet, 3 English and 1 German

ASSOCIATION: Institut elektrosvarki imeni Ye. I. Patona AN UZSSR Institute of Electric Welding imeni Ye. I. Paton, AN UkrSSR

SUBMITTED: September 5, 1958

Card 2/2

18.5)
 AUTHOR: SOV/125-59-10-1/16
 Makara, A.M., and Slutskaya, T.M., Candidates of
 Technical Sciences, and Mosendz, N.A., Engineer
 TITLE: The Welding of High-Quality Steels by Means of Fused
 Fluxes
 PERIODICAL: Avtomaticheskaya svarka, 1959, Nr 10, pp 3-8 (USSR)
 ABSTRACT: While D.M. Rabkin, A.M. Makara and Yu. N. Gotal'skiy,
 of the Ye. O. Paton Institute of Electric Welding,
 developed fused fluxes (Types AN-15 and AN-42) of low
 silicon and manganese content back in 1951 for use in
 the welding of steel of medium hardness, this article
 is concerned with the results of tests showing that
 the use of type AN-15 fused flux in the welding of
 high-quality steel can raise the toughness to over 6
 kilogram meters/cm². The authors concur with A.V.
 Lyubavskiy [Ref 2] in his theory that the presence
 of oxygen in the metal of the seam is the cause of
 the low toughness, but add that the phosphorus con-
 tent is also an important factor. Of the fluxes
 tested it was found that the content of phosphorus in
 flux type AN-348A (made from Chiatura ore) amounted
 to as much as .12%, meaning a percentage of as much

Card 1/4

SOV/125-59-10-1/16

The Welding of High-Quality Steels by Means of Fused Fluxes

as 1% in the welded seam; the toughness of the seam thus decreased accordingly, this drop also being heightened by the presence of carbon and manganese in the seam. To obtain a high degree of toughness in the welding of high-quality steel it is thus necessary to keep the SiO_2 and MnO content to a minimum. It is also stressed that fluxes intended for such welding should be of maximum basicity, in order to lower the sulfur and phosphorus content in the seams, to raise their resistance to the formation of crystallization cracks, and also to improve the initial structure of the metal of the seam [Refs 6 and 7]. Fluxes answering to these requirements are given in Table 1. Flux Type AN-15, which is superior to all others, is made up of aluminum oxide, feldspar, fluorite spar, caustic magnesite and manganese ore, its 2.2% MnO content reducing the oxidation of manganese in the seam and cutting the phosphorus content to virtually nil; it is simple in manufacture and versatile in use. Tests were conducted on this flux by means of test-pieces of 30KhGSNA steel tubing 100-300mm in diameter, with walls

Card 2/4

SOV/125-59-10-1/16

The Welding of High-Quality Steels by Means of Fused Fluxes

8, 16 and 25mm thick; the welding was carried out by types 18KhMA and Kh5M electrode wire. Fig 1 shows a cross-section of the seam-edge, and the welding process was as follows: layer 1 - $I_{sv} = 200$ amps, $U_d = 26$ volts, $v_{sv} = 15$ m/hour; layer 2 and subsequent layers - $I_{sv} = 350$ amps, $U_d = 30$ volts, $v_{sn} = 19$ m/hour. The edges were previously heated to 250°C . Table 2 gives the chemical composition of the upper-layer metal of several multi-layer seams and also furnishes data on tests on Type AN-348A flux, showing that the use of AN-15 flux cuts the content of oxygen by 200% and of phosphorus by 100%. Fig 2 is a diagram of the method used for cutting tubes of 3 thicknesses, and the macro-structure of the seam is given in Fig 3. Table 3, containing the results of tests carried out on the test-pieces after the thermal processing of 30KhGSNA steel (temperature at 900°C , annealing at $250-300^\circ\text{C}$), indicate that the toughness of the metal of the seam is raised to an average of 8 kilogram meters/cm². In their conclusion the authors stress the advantages of this flux: low oxygen and

Card 3/4

SOV/125-59-10-1/10
The Welding of High-Quality Steels by Means of Fused Fluxes
phosphorus content, high toughness, and simplicity of
application. There are 3 tables, 2 diagrams, 2 pho-
tographs, and 7 Soviet references.

ASSOCIATION: Ordena trudovogo krasnogo znameni institut elektros-
varki imeni Ye.O. Patona AN USSR (Order of the Red
Banner of Labor Institute of Electric welding imeni
Ye.O.Paton AS UkrSSR)

SUBMITTED July 2, 1959

Card 4/ 4

25(1,5)

SOV/125-12-4-7/18

AUTHORS:

Makara, A.M., Candidate of Technical Sciences, Novikov, I.V., Nazarov, G.V., Ryabinkin, V.I.,

TITLE:

Working out the Technology of "Electric Slag Welding" of Shells, Made of Medium Alloyed Steel T₁₂ AK

PERIODICAL:

Avtomaticheskaya svarka, 1959, Vol 12, Nr 4, pp 55-65 (USSR)

ABSTRACT:

The article presents the results of investigations, made in the Institute for Electric Welding and the "Krasnoye Sormovo" Plant. To weld the steel AK complex alloyed wires type EI 581 and EI 616 are used. The content of dangerous elements as carbon, sulphur, phosphorus in the weld is small, because there are very small amounts of them in the basic metal and in the metal of the electrode-wire. To weld AK-steel with a thickness of 50 mm following conditions were chosen: electrode feed rate: 180-200 m/h; arc-voltage: 54-55 V; welding-current: 400-440 A; depth of the slag-tub 45-50 mm; dry-boom: 60-60 mm; diameter of

Card 1/2

SOV/125-12-4-7/18

Working out the Technology of "Electric Slag Welding" of Shells,
Made of Medium Alloyed Steel Type AK

electrode-wire: 3mm; welding-clearance 25-28 mm;
speed of welding: 0.7-0.8 m/h. Alternation current.
The chemical consistence of the electrode wire is
shown in schedule 1. Investigation of the macro-
and micro-structure of the weld showed a coarse cry-
stalline structure, which disappeared after heat-
treatment. For electric-slag-welding the apparatus
type A-372- (Figure 10) is used. There are 7 photo-
graphs, 2 graphs, 4 diagrams and 6 Soviet references.

ASSOCIATION: Ordena trudovogo krasnogo znameni institut elektro-
svarki im. .O. Patona AN USSR (Institute of the
Order of the Red Banner of Labor for Electric Welding
imeni .O. Patona AN UkrSSR) Gor'kovskiy zavod "Kra-
noye Sormovo" (Gorkiy Plant "Krasnoye Sormovo")

SUBMITTED: February 13, 1958

Card 2/2

187200
25(1)

67700
SOV/125-60-2-2/21

AUTHOR: Makara, A.M.

TITLE: Investigation of the Nature of Cold Cracking¹⁶ in Heat-Affected Zone in Welded Hardening Steels¹⁴

PERIODICAL: Avtomaticheskaya svarka, 1960, Nr 2, pp 9-33 (USSR)

ABSTRACT: The article presents the contents of the author's report at the all-Union coordination conference on the problem of cold cracking which convened in Kiyev 12-13 Nov 1959. It is a brief review of data from 35 sources [Ref. 1-35], Soviet and foreign (9 of which were partly or wholly written by Makara), and information on new experimental data. The described experiments were carried out with "35Kh3N3M"¹⁶ steel, which is highly prone to cold cracking in the heat-affected zone at the welds. The low-hydrogen "AN-62" flux and ferrite "Sv-08" welding wire were used. An ultrasonic "UZD-7H" flaw detector was employed for revealing cracks by a

Card 1/7

4

67700

SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

new method (developed with the cooperation of V.A. Tsechal'). The "hardening hypothesis" on which some Soviet and foreign investigation works were based [Ref. 16, N.N. Rykalin and L.A. Fridlyand; Ref. 18, N.O. Okerblom and other Soviet references; Ref. 25, L. Reeve; Ref. 26, C.B. Voldrich; Ref. 27 and 28, A.H. Cottrell of the British references], and the "hydrogen hypothesis" of crack origination [Ref. 13, 14, A.H. Cottrell; Ref. 15, K.L. Zeyen] were disproved, i.e. found not generally true. The technology of the experiments are described. It is mentioned that the X-ray stress measurement method used (developed jointly with N.L. Kareta), with a thin layer of low-carbon steel welded on the specimen serving as a pickup showing the deformation, will be later described. The hypothesis 4

Card 2/7

67700

SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-affected Zone
in Welded Hardening Steels

suggested by S.S. Shurakov, that the decrease in strength is connected with the quasiviscous and plastic flow of the grain boundaries,⁶ was confirmed by the experiments. The following conclusions can be drawn.

1) It appears that cracks form as a result of slow disintegration of metal which has been superheated and hardened under specific conditions in the heat-affected zone. 2) The kinetics of transformation of supercooled austenite in the heat-affected zone depend not only on the steel composition and the thermic welding cycle, but also on the cycle of elastico-plastic deformation in this zone during the welding process. 3) The stress condition of welded joints of hardening steels is characterized by sharp changes in the longitudinal stresses on the border seam-zone of hardening and, therefore, by considerable shearing stresses on this border; by 4

Card 3/7

67700

SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

small tension stresses in the transverse direction in the middle part of the seam, and by comparatively large compression stresses along its edges. 4) The cracks originate along the borders of the grains in the large grain section, and, slowly develop first only along the borders, and then in the grain body. 5) All processes that further an orderly atom structure along the grain borders, the strengthening of these borders, and help to involve the grain body into the deformation process, increase the resistance of the heat-affected zone against the formation of cracks. 6) Crack resistance in the heat-affected zone can be increased by improving the metal structure, i.e. by displacing the martensite transformation into the zone of high temperature and slowing down the cooling during this transformation, as well as limiting the overheating. Besides, abrupt

Card 4/7

67700
SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

changes of stresses must be eliminated and the hydrogen content must be reduced. 7) New methods of crack prevention can be recommended: a) increased quantities of additives in weld metal which displace the transformation of undercooled austenite into the zone of low temperature and increase the volume in the gamma-alpha transformation; b) slowing the cooling of the heat-affected zone in the interval 100-200°C in which the restoration of the nuclear structure on the grain boundaries is still sufficiently intensive; c) the use of vibration after welding, i.e. knocking by a pneumatic chisel, grinding off the surplus weld metal, and the use of ultrasonic vibration. 8) The methods of investigation (of transformation in the heat-affected zone, and evaluation of the resistance to cracking) recommended by N.N. Prokhorov [Ref. 21, 22] should be used. 9) The

Card 5/7

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67700

SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

results of the described investigation (of interest to general metal science and metal physics) are as follows: a) The effect of low temperature and vibration on the resistance of hardened metal to slow destruction. Particularly interesting is the fact that slow destruction resumes after defreezing; b) Very small plastic deformations have a noticeable effect on the kinetics of the martensite transformation; c) A method has been developed for studying the formation and propagation of cracks with the use of ultrasonic control; d) Also a method for studying the effect of small plastic deformation on the martensite transformation, with the use of a two-layer specimen; e) And a method of X-ray study of stresses in hardened metal, with the use of fused-on metal pickups. There are 2 diagrams, 1 photo-

Card 6/7

67700

SOV/125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

results of the described investigation (of interest to general metal science and metal physics) are as follows:
a) The effect of low temperature and vibration on the resistance of hardened metal to slow destruction. Particularly interesting is the fact that slow destruction resumes after defreezing; b) Very small plastic deformations have a noticeable effect on the kinetics of the martensite transformation; c) A method has been developed for studying the formation and propagation of cracks with the use of ultrasonic control; d) Also a method for studying the effect of small plastic deformation on the martensite transformation, with the use of a two-layer specimen; e) And a method of X-ray study of stresses in hardened metal, with the use of fused-on metal pickups. There are 2 diagrams, 1 photo-

4

Card 6/7

SOV/⁶⁷⁷⁰⁰125-60-2-2/21

Investigation of the Nature of Cold Cracking in Heat-Affected Zone
in Welded Hardening Steels

-diagram, 7 graphs, 9 photos, and 35 references, of
which 25 are Soviet, 1 German, and 9 English.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektros-
varki im. Ye.O. Patona AN USSR (Order of the Red Banner
of Labor Institute of Electric Welding imeni Ye.O.
Paton of the AS UkrSSR). 4

SUBMITTED: December 1, 1959.

Card 7/7

18 8260
1.2360 also 1573

21906

S/125/60/000/011/001/015
A161/A133

AUTHORS: Kareta, N.L., and Makara, A.M.

TITLE: X-Ray measurements of first order residual stresses in the heat-affected zone of welds on hardening steel

PERIODICAL: Avtomaticheskaya svarka, no. 11, 1960, 3-9

TEXT: The article contains brief general information on X-ray measurements of residual welding stresses in the heat-affected zone of common steel, and a detailed description of a new method developed for such measurements in hardening steel, called "method naplavlennykh datchikov" ("Built-up strain gage method"). Two X-ray photographs have to be prepared - at right angles, and with a slanting angle relative to the surface in the stress direction. The interplane distances d_1 and d_2 are found from the pictures, and they are not equal in the presence of residual stresses of first order. Stress is calculated using the formula (Ref.7):

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Card 1/6

21706

S/125/60/000/011/001/016

A161/A133

X-Ray measurements of first order...

$$\sigma_{\varphi} = \frac{d_{\psi} - d_{\perp}}{d_{\perp}} \cdot \frac{E}{1 + \nu} \cdot \frac{1}{\sin^2 \psi} \quad (1)$$

where E is the Young modulus; ν - the Poisson coefficient; ψ - the angle between the X-ray and the normal to the specimen surface in inclined X-ray picture. The formula (1) can be transformed:

$$\sigma_{\varphi} = B(L_{\psi} - L_{\perp});$$

$$\frac{\operatorname{ctg} \theta \cos^2 (180^\circ - 2\theta)}{4R} \cdot \frac{E}{1 + \nu} \cdot \frac{1}{\sin^2 \psi} \quad (2)$$

where L_{ψ} and L_{\perp} are the diffraction ring diameters at inclined and perpendicular X-raying; θ - the Wolf-Bragg angle; and R the distance from the specimen to the film. The B value is determined by the photographing conditions that are constant, and it has a numerical value. This makes the formula (2) very handy in practical work. The accuracy of stress measurements depends on the θ and ψ angles, the R distance, and the elastic properties of the metal. It is obvious that the θ angle should be as large as possible. In the case of ferritic steel it is better to use the reflection (310) of $K_{\alpha} \text{Co}$ ($\theta =$

Card 2/6

X-Ray measurements of first order...

21306
S/125/60/000, 001, 002
A161/A133

80°40'), and in the case of austenitic steel the reflection (220) of K_{α} radiation ($\theta = 80^{\circ}10'$). The ψ angle should be as large as possible. Still, the interference lines are diffused through absorption at a too large ψ angle, and it is therefore recommended to use ψ of about 45° and not larger. The distance from specimen to film is to be chosen so as to increase the accuracy at practically possible exposition time. Tests of specimens proved that X-raying is only applicable for approximate stress measurements in common carbon steel; in hardening 35X3H3M (35Kh3N3M) steel the measurements were impossible because of diffused interference lines. The "built-up strain gage method" had been suggested after failure with measurements in hardening steel, and was a success. Its essence is the following. Grooves 10 mm deep and 1 - 1.5 mm wide were cut in the metal, and УОНН-13/45 (УОНИ-13/45) 3 mm electrodes fused into the grooves using welding current not exceeding 90 amp. The fused metal had a low carbon and alloying element content and did not harden in the subsequent welding process. The X-ray pictures in the heat-affected metal with the "gages" were clear (Fig.2,b), and the distance between the lines could be measured with an accuracy usual for the X-ray method. The method is applicable for measuring stresses not exceeding 40-50 kg/mm², for the "gage" metal flows at higher stresses. A curve shows the longitudinal

Card 3/6

21906

X-Ray measurements of first order...

S/125/60/000/011/001/016
A161/A133

stress distribution in an austenite steel butt joint (Fig.4) measured by the new method and with two others for comparison. It is an advantage of the new method that it makes the observation of changing stresses possible during relaxation process after hardening. It is expected that the X-ray method will come into use for studies of hardening processes in metals. There are 4 figures and 8 Soviet references

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im.Ye. O.Patona AN USSR ("Order of the Red Banner of Labor" Electric Welding Institute im.Ye.O.Paton of the Academy of Sciences of the Ukrainskaya SSR)

SUBMITTED: July 16, 1960

Card 4/6

X-Ray measurements of first order...

21906
S/125/60/000/011/001/016
A161/A133

Fig. 2

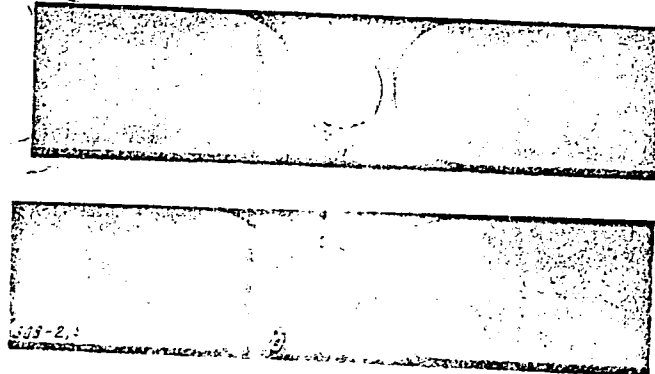


Figure 2

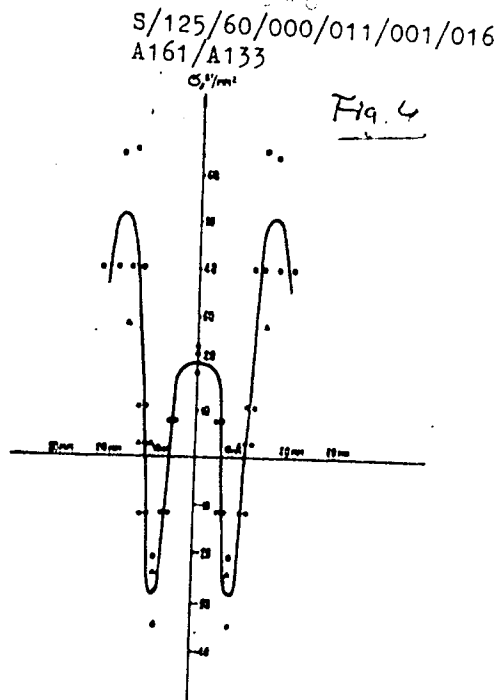
- a - 35Kh3N3M steel
- b - fused on "gage" metal

Card 5/6

X-Ray measurements of first order...

Figure 4:

Distribution of longitudinal stresses in a butt weld in 35Kh3N3M steel, with austenitic weld metal. Deformations measured \odot - with deformation; \circ - with resistor strain gages; Δ - by the X-ray method



Card 6/6

MALEVSKIY, Yuzef Boleslavovich; GRABIN, Vladimir Fedorovich; DAROVSKIY, Georgiy Fedos'yevich; PARFESSA, Galina Ivanovna; ROSSOSHINSKIY, A.A., kand.tekhn.nauk, retsenzent; MAKARA A.M., kand.tekhn.nauk, red.; RIKBERG, D.B., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn.red.

[Atlas of the micro- and macrostructure of welded joints] Atlas makro- i mikrostruktur svarnykh soedinenii. Pod red. A.M. Makara. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961.
118 p.
(MIRA 15:2)

(Welding--Testing) (Metallography)

MAKAPA P.M.

29

PHASE I BOOK EXPLOITATION

SOV/5975

International Institute of Welding

XII kongress Mezhdunarodnogo instituta svarki, 29 iyunya - 5 iyulya 1959 v g.
Opatii (Twelfth Annual Assembly of the International Institute of Welding,
Opatija, June 29 - July 5, 1959) Moscow, Mashgiz, 1961. 359 p. 3000
copies printed.

Sponsoring Agency: Natsional'nyy komitet SSSR po svarke.

Ed. (Title page): G. A. Maslov, Docent, Translated from English, French,
and Serbo-Croatian by N. S. Aborenkova, K. N. Belyayev, E. P. Bogacheva,
L. A. Borisova, K. V. Zvegintseva, V. S. Minavichev, and M. M. Shchennik;
Managing Ed. for Literature on the Hot-Working of Metals: S. Ya. Golovin,
Engineer.

PURPOSE: This collection of articles is intended for welding specialists and
the technical personnel of various production and repair shops.

Card 1/1

29

SOV 5975

Twelfth Annual Assembly (Cont.)

COVERAGE: The collection contains abridged reports presented and discussed at the Twelfth Annual Assembly of the International Institute of Welding. Reports deal with problems of welding and related processes used in repair work, repair techniques, and the problems arising in connection with the nature of the base and filler materials. Examples of repair of various parts are given, and the organization of repair operations in workshops and under field conditions is discussed. Economic aspects of welding and related processes as used in repair work are analyzed. No personalities are mentioned. There are no references.

TABLE OF CONTENTS [Only Soviet and Soviet-bloc reports are given here]

Foreword

5

PART I. THE STUDY OF REPAIR-WORK TECHNIQUES
(PROCESSES, METHODS, PREPARATION, HEATING, AND
OTHER TYPES OF PROCESSING CONTROL)

Myuntaner, L. (Czechoslovakia). Welding of Broken Crankshafts

36

Card 2/9

75

SOV/5975

Twelfth Annual Assembly (Cont.)

Tesar, A., and Yu. Lombardov (Czechoslovakia). Isothermal and Ultracold Welding of High-Strength Steels 42

Paton, B. Ye., G. Z. Voloshkevich, D. A. Duda, Yu. A. Stetsko, A. M. Makara, P. I. Svirid, O. Rozenberg (USSR). Electroslag Welding in Repairing Heavy Machines and Mechanisms 4

Frumin, I. I., A. Ye. Asnis, L. M. Gutman, G. V. Ksendzyk, V. A. Lapchenko, Ye. I. Levchenko, Ye. N. Morozovskaya, I. K. Polubodnya, V. P. Shostakovskiy, and F. A. Khomus'ko (USSR). Automatic Weave-Resistant Submerged-Arc Surfacing 46

Snegon, K. (Poland). Restoration of Rolling-Mill Rolls, Crane Rollers, Forging Dies, and Shears by Arc Welding 72

Card 3/9

26784
S/125/61/000/005/001/016
A161/A127

18000

AUTHORS: Makara, A. M., Tsechal', V. A., Zhovnitskiy, I. P.

TITLE: Determining the development of cold cracks in welded joints by ultrasonic flaw detection

PERIODICAL: Avtomaticheskaya svarka, no. 5, 1961, 3 - 10

TEXT: A new method developed by the Institut elektrosvarki im. Ye. O. Patona (Electric Welding Institute im. Ye. O. Paton) makes it possible to determine the moment of crack initiation and their further propagation in welds. An Y3A-7H (UZD-7N) ultrasonic flaw detector of TsNIIITMASH design was used. The investigations were conducted with h-f oscillations of 2.5 Mc, with prismatic feelers producing a 30° sound beam angle, one feeler performing the functions of both transmitter and receiver. Silicon oil was used on the specimen surface, which ensured a dependable contact at temperatures about 150°C. Butt welds were prepared in 14 mm thick 35X3H3M (35Kh3N3M) medium-alloyed steel with straight edges and single-bead welds. The shape was chosen for convenience, for cold cracks in such welds usually develop at about right angles to the surface, and the reflection is clear. Already a slight increase of a crack caused a noticeable change in the reflected

Card 1/3

26784
S/125/61/000/005/001/016
A161/A127

Determining the development of cold cracks in...

ultrasonic energy on the screen. However, vertical internal cracks in metal do not produce such an effect, and it was not possible to watch and record slight increases of cracks of this kind. It is emphasized that also other flaws than cracks (cold shuts, notches) are being reflected, and preparatory experiments are necessary with specimens of the chosen geometric shape to spot and determine the other reflections before the tests. The length of cracks is determined as usual in such flaw detection, i.e. by two positions of the feeler being moved to and fro. The depth of cracks was judged by the changing amplitude of reflected signal. The amplification was correspondingly reduced, for otherwise the signals would reach beyond the screen. A graph was plotted by which the depth of cracks may be determined with ± 0.5 mm accuracy. Error is highest at about 1 mm crack depth. At low crack depths the accuracy increases to ± 0.2 mm. Reflections from notches were different from reflections from cracks. The data show that initial microscopic cracks are starting at both ends of the seam at the boundary with the base metal in 20 - 25 min after termination of welding, when the metal temperature is about $140 - 130^{\circ}\text{C}$, and the depth of initial cracks is below one millimeter. The number of initial cracks reached up to ten in 3 hrs. The crack propagation was different - some cracks remained stable for a long time and then propagated rapidly, and some vice versa. Only in 2 - 3 days cracks became visible to unaided eye. Cracks

Card 2/3

26784

S/125/61/000/005/001/016

A161/A127

Determining the development of cold cracks in...

in specimens subjected to a tension stress of 20 - 25 kg/mm² initiated as all other and spread slowly for several hours, then developed instantaneously to complete failure of specimen. The conclusion is drawn that the method is suitable for studying the kinetics of slow destruction in welded joints as well as in metals in general, e.g., the initiation and spreading of hardening cracks that are forming slowly after heat treatment. There are 11 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: A. N. Cottrell, A Note on the Initiation of Hardened Zone Cracks, "The Welding Journal", no. 11, 1944.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR ("Order of the Red Banner of Labor" Electric Welding Institute im. Ye. O. Paton AS UkrSSR)

SUBMITTED: January 28, 1961

Card 3/3

OSTROVSKIY, S.A., kand. tekhn. nauk; RABKIN, D.M., kand. tekhn. nauk;
MAKARA, A.M., kand. tekhn. nauk; SHEVEINITSKIY, V.V., kand. tekhn.
nauk; ASNIS, A.Ye., kand. tekhn.nauk; POKHODNE, I.K., kand.tekhn.
nauk; PODGAYETSKIY, V.V., kand.tekhn.nauk; PATON, B.Ye., laureat
Leninskoy premii, akademik, doktor tekhn. nauk; BEL'FER, M.G., inzh.;
MANDEL'BERG, S.L., kand.tekhn.nauk; MEDOVAR, B.I., doktor tekhn.nauk;
GUREVICH, S.M., kand.tekhn.nauk; LATASH, Yu.V., kand.tekhn.nauk; KIRDO,
I.V., kand.tekhn.nauk; SOROKA, M.S., red.; GORNOSTAYPOL'SKAYA, M.S.,
tekhn.red.

[Technology of electric fusion welding] Tekhnologiya elektricheskoi
svarki plavleniem. Moskva, Mashgiz, 1962. 663 p. (MIRA 15:12)

1. Nauchnyye sotrudniki Instituta elektrosvarki imeni Ye.O.Patona
(for all except Soroka, Gornostaypol'skaya).
(Electric welding)

S/125/62/000/006/012/013
D040/D113

AUTHORS: Makara, A.M., and Teropov, V.A.

TITLE: Welding problems at the International Scientific and Technical Conference of Machine-Building Technologists

PERIODICAL: Avtomaticheskaya svarka, no. 6, 1962, 88-94

TEXT: The Soviet ekonomicheskoy vzaimopomoshchi (Council of Economic Mutual Assistance)-SEV convened the Mezhdunarodnaya nauchno-tekhnicheskaya konferentsiya tekhnologov-mashinostroiteley (International Scientific and Technical Conference of Machine-Building Technologists) in Prague in late 1961. Experience was exchanged and means of speeding up the industrial application of modern technology discussed. Detailed information on the Welding Institute in Bratislava and the Institute of Welding Equipment and Technology in Prague, including the equipment and methods used there, is given. Both institutes were visited by Soviet delegates after the conference. The following reports were heard: V.N. Zubko (USSR), "The development of progressive technology in heavy machine-building on the basis of specialized production"; Makara (USSR), "The state and trends of

Card 1/3

welding problems at the International Scientific

S/125/62/000/001/012/013
D040/D113

development of welding techniques"; K.Kapral (ČSSR), "Progressive methods of the technological preparation of production"; J.Vrdlový (ČSSR), "A new technology for producing modern machines and equipment"; Z.Faludi (Hungary), "A method of technically and economically planning technological development"; Toropov (USSR), "The present state and problems of welding in chemical machinery"; V.Hora (ČSSR), "The prospective development of modern methods in the production of chemical equipment", reference being made to a new high-pressure vessel designed at the Kralovo Pole Plant; L. Zawitnewicz (Poland), "Automatic welding equipment used for submerged arc welding of 1.5-4 mm thick sheets"; A.Zawitnewicz, Engineer, read a report describing welding of thin metal, and a special welding line equipped with A55-600 motorized welders produced by the Welding Institute in Gliwice. Reference is made to a welding method and a flux developed by the Institut elektrosvarki im. Ye.O.Patona (Electric Welding Institute im. Ye.O.Paton) and now used in the ČSSR.

Card 2/3

Welding problems at the International Scientific S/125/62/000/006/012/013
D040/D113

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki
im. Ye.O.Patona AN USSR (Electric Welding Institute "Order of
the Red Banner of Labor" im. Ye.O.Paton, AS UkrSSR)
(Makara, A.M.); Moskovskiy nauchno-issledovatel'skiy institut
khimicheskogo mashinostroyeniya (Moscow Scientific Research
Institute of Chemical Machinery) (Toropov, V.A.)

Card 3/3

makara, A.M.
L 11881-63

EWP(k)/EWP(q)/EWT(m)/BDS AFFTC/ASD
PHASE I BOOK EXPLOITATION

Pr-4

JD/HM

SOV/6330

Paton, B. Ye., Lenin Prize Winner, Academician, ed.

Tekhnologiya elektricheskoy svarki plavleniyem (Technology of Electric Fusion Welding) *18* Moskva, Mashgiz (Southern Dept.), 1962. 663 p. Errata slip inserted. 25,000 copies printed.

Ed.: M. S. Soroka; Tech. Ed.: M. S. Gornostaypol'skaya; Chief Ed.: V. K. Serdyuk, Engineer.

Review: Department of Welding, Leningrad Polytechnic Institute; and Department of Welding, Moscow Higher Technical Institute imeni Bauman.

PURPOSE: This handbook is intended for students of schools of higher education who specialize in welding. It may also be used by engineering personnel of scientific research organizations and plants.

Card 1/173

L 11881-63

Technology of Electric Fusion (Cont.)

SOV/6330

3

COVERAGE: The book reviews the basic principles of the technology of electric fusion welding of various metals and their alloys. Classification of welding processes and comparative characteristics of mechanized and manual welding methods are presented. Weldability problems and causes of defects in welded joints are discussed. Information on materials, equipment, and conditions of welding and surfacing of various metals, alloys, and structures is given. Brief information on the use of heat sources employed in special types of welding and on safety precautions is also given. The Introduction, Chapter I (except the part headed "Arc Welding" in section 1), Chapter II (except the part headed "Cold Cracks" in section 5, the part on methods of determining resistance to brittleness in sections 6, 7, 8, 9, 11, and 14) are the work of S. A. Ostrovskaya, Candidate of Technical Sciences. The part entitled "Welding Arc" in paragraph 1 was written by Ostrovskaya in cooperation with D. M. Rabkin, Candidate of Technical Sciences. A. M. Makara, Candidate of Technical Sciences, wrote the parts entitled "Cold Cracks" in

Card 2/175

L 11881-63

Technology of Electric Fusion (Cont.)

SOV/6330

12

section 5 and 20. The part on methods of determining the temperature of transition to brittle behavior in section 6 is the work of V. V. Shevernitskiy, Candidate of Technical Sciences. Section 10 was written by A. Ye. Asnis, Candidate of Technical Sciences. I. K. Pokhodnya, Candidate of Technical Sciences, wrote section 12 and Chapter IX, while section 13 and Chapter XI were written by V. V. Podgayetskiy, Candidate of Technical Sciences. Chapter V is the joint effort of B. Ye. Paton and M. G. Bel'fer, Engineer. S. L. Mandel'berg, Candidate of Technical Sciences, is author of Chapter VI and section 19. Section 21 was written by B. I. Medovar, Doctor of Technical Sciences, and section 22 by Rabkin. Section 23 is the work of Yu. V. Latash, Candidate of Technical Sciences, while Chapter X was written by I. V. Kirdo, Candidate of Technical Sciences. The authors thank Doctors of Technical Sciences N. O. Okerblom and G. A. Nikolayev, respective heads of the reviewing departments, for their valuable comments. There are 31 references, all Soviet.

Card 3/12

S/125/63/000/002/001/010
A006/A101

AUTHORS: Sterenbogen, Yu. A., Makara, A. M.

TITLE: On the possibility of renouncing normalization of structures
produced with the aid of electric-slag welding

PERIODICAL: Avtomaticheskaya svarka, no. 2, 1963, 10 - 16

TEXT: The authors present data of investigations on the operational capacities of electric-slag welded structures. It is established that these capacities do not only depend upon the toughness of the parts, but upon a combined effect of factors, such as low operational temperatures; increased sensitivity to embrittlement of the base metal and the welded joint; stress concentrators, etc. Investigations carried out at TsNIITS have shown that in spite of a lower toughness of electric-slag welded joints against manually welded carbon steel joints, the former showed a lesser sensitivity to embrittlement. The investigation was made to show the possibility of renouncing normalizing of electric-slag welded joints in ship parts, such as ship stems, rudder parts etc. Series data on the quality of electric-slag welded joints which were not normalized, have been obtained for various

Card 1/2

On the possibility of renouncing normalization of...

S/125/63/000/002/001/010
AC06/A101

grades of steel, such as MCr .3 (MSt.3) 22K, 25 Л (25L), 35 Л (35L), 16 ГТ (3H) (16GT(3N), 12 ГТ (M) (12GT(M), 20 ГСЛ (20GSL), 08 ГДНФЛ (08GDNFL); these data and the experimental operation of various structures having such joints, show the possibility of using this new method for different parts, e.g. coatings of ship hulls (up to 30 mm thick) forging-press frames, cement furnace shells and bandages, etc. In electric-slag welding, defects such as poor welding, cracks, slag inclusions, are prevented more reliably than in arc welding; as a result the operational efficiency of the parts is increased, and there is less danger of brittle failure for the welded structures.

ASSOCIATION: Institut elektrosvarki imeni Ye. O. Patona, AN USSR (Institute of Electric Welding imeni Ye. O. Paton, AS UkrSSR)

SUBMITTED: September 28, 1962

Card 2/2

MAKARA, A.M.; YAGUPOL'SKAYA, T.M.; SLUTSKAYA, T.M.; KOP'YEV, M.I.;
USHAKOV, I.S.; SMIRNOVA, I.A.

Resistance to hydrogen corrosion in alloyed steel joints made by
electric slag welding. Avtom. svar. 16 no.6:24-29 Je '63.
(MIRA 16:7)

1. Institut elektrosvarki im. Ye.O.Patona AN UkrSSR (for Makara,
Yagupol'skaya, Slutskaya). 2. Gosudarstvennyy institut azotnoy
promyshlennosti (for Kop'yev, Ushakov, Smirnova).
(Steel alloys--Corrosion) (Electric welding)

L 39986-65 EWP(k)/EWP(z)/EWA(c)/EWT(d)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t)
 PT-J BH/MLW/JD/E/CS

ACCESSION NR: AT5008307

S/0000/64/000/000/0247/0265

AUTHOR: Makara, A. M. (Candidate of technical sciences)

TITLE: Welded joints in high-strength steels

SOURCE: AN UkrSSR. Institut elektrosvarki. Novyye problemy
 svarochnoy tekhniki. (New problems in welding technology). Kiev,
 Izd-vo Tekhnika, 1964, 247-265

TOPIC TAGS: superstrength steel, complex alloy steel, steel welding,
MIG welding, electroslag welding, sheet welding, plate welding

ABSTRACT: An analysis is presented of the results of a systematic
 investigation carried out at the Electric Welding Institute during
 1959—1963 of the weldability of recently developed superstrength,
complex-alloy steels of the 30KhGSN or 40KhNVEHA type. Such steels
 contain up to 5—7% of the alloying elements and from 0.28 to 0.45%C,
 and are heat treated to a tensile strength of 160—200 kg/mm². The
 main purpose of the investigation was to determine the welding meth-
 ods and conditions which would ensure a weld strength equal to that

Card 1/4

L 39986-65

ACCESSION NR: AT5008307

3

of the base metal. In argon shielded-arc welding of 2-mm thick 38Kh3SNVMA steel sheets, the single-pass weld contained 0.03—0.04% less carbon but was stronger than the parent metal. On the other hand, in electroslag welding of 100-mm thick 30Kh2GSNVMA steel plate and 90-mm thick 30KhGSN steel plate, the loss of carbon was 0.05—0.02% and that of silicon, manganese, chromium, and tungsten, 0.1—2.0%, and the strength, ductility, and notch toughness of the welds was lower than the parent metal. The high strength of the welds in thin steel sheets is a result of high chemical homogeneity, additional alloying, and a high density of dislocations, all of which are brought about by rapid crystallization. A low content of sulfur, phosphorus, gases, and nonmetallic inclusions in the parent metal is a most important factor in achieving weld strength equal to that of the parent metal. The upper limit of 0.04 for sulfur and phosphorus, which is acceptable for ordinary structural steels, is inadmissible for high-strength thin-sheet steels. No reliable method has yet been developed for mechanized arc welding of high-strength steel plates 10—30 mm thick, which would ensure a joint strength equal to that of the parent metal, i.e., more than 150 kg/mm². Another problem in welding superstrength sheets is hot cracking. A substantial reduction in the sulfur

Card 2/4

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ACCESSION NR: AT5008307

3

content in the weld metal and a higher resistance to hot cracking has been achieved with the use of low-silicon fluxes of the AN-15 or AN-15M type. An additional means of preventing hot cracking of welds in steel plates is alloying of the weld metal. Thus, by using OKh4M electrode wire, an AN-15 type flux, and suitable welding conditions, high-quality welds with a tensile strength of 145 kg/mm² and a notch toughness of 6 kgm/cm² were obtained. The most promising directions of the research in welding of superstrength steels include flash welding of large parts and electron-beam welding. These methods would ensure a strength of 200—220 kg/mm². Further increase can be obtained by a thermomechanical treatment of the parent metal either before or after welding. Welding of prestrengthened steel presents a complex problem. A solution can probably be found by combining the maximum possible mechanical strengthening with flash, electron-beam, or laser welding, and by improved joint design. With thermomechanical treatment applied after welding, the weld must respond to treatment the same way as the parent metal. Orig. art. has: 2 figures and 3 tables. [MS]

Card 3/4

L 39986-65

ACCESSION NR: AT5008307

ASSOCIATION: Institut elektrosvariki im. Ye. O. Patona AN UkrSSR
(Electric Welding Institute)

SUBMITTED: 05Nov64

ENCL: 00

SUB CODE: MM, IE

NO REF SOV: 017

OTHER: 000

ATD PRESS: 3229

Card 4/4/66

MAKARA, A.M.; MOSHIDZ, N.A.; SLOAN, D.A.M.; SIVYKHIN, I.A.

during the first half of the
a thickness of 3mm. After a . . . 189

L 20103-65 EWI(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b) ASD(m)-3 MJW/JD
 ACCESSION NR: AP4045454 S/0125/64/000/009/0001/0010

AUTHOR: Makara, A. M. (Doctor of technical sciences); Mosendz, N. A. (Engineer)

TITLE: The nature of the effect of a metal joint on crackformation in the welding area

SOURCE: Avtomaticheskaya svarka, no. 9, 1964, 1-10

TOPIC TAGS: metal joint, austenite transformation, bainite, martensite, cold crack plastic deformation

ABSTRACT: The authors discuss numerous papers dealing with the effect of the weld seam on crack formation. They developed a method of testing the joints for resistance to cold cracking by the application of tensile stresses to ferritic-pearlitic, bainite-martensitic and austenitic butt joints during the cooling off period. It was found that the difference between the maxima and minima stresses did not exceed 25% in the individual spots. A special series of tests was conducted to investigate deformation in the joint area of butt-welded 35Kh3N3M steel plates, $\delta = 12\text{mm}$. The resistance to cold cracking was substantially enhanced in all specimens by the formation of stresses in excess of 10 kg/mm^2 at a maximum

Cord 1/4

L 20103-65

ACCESSION NR: AP4045454

temperature of 500 C. These stresses intensified the austenite transformation at high temperatures. The initial stage of austenite transformation in the weld area shifts from the martensite region into the bainite region resulting in better structure and improved quality. The effect of the chemical composition and the metal structure of the joint on cold cracking strength is attributed to the physical properties of the joint metal and the structural transformations which affect the process of deformation in the weld area and, consequently, the kinetics of austenite transformation the bainite and martensite regions. Under the action of $\sim 10 \text{ kgG/cm}^2$ stresses at the initial stage of bainite and martensite transformation in 35Kh3N3M steel under conditions of continuous cooling plastic deformation is highly developed. It follows that welding stresses are somewhat lowered which also enhances cracking strength. The authors propose a method of predetermined deformation during cooling to increase the resistance to cold cracking. A further study is suggested with a view of investigating the effect of deformation on austenite transformation in a great variety of alloy steels and under different welding conditions. Orig. art. has: 7 figures and 2 tables

Card 2/4

L 20103-65

ACCESSION NR: AP4045454

ASSOCIATION: Institut elektrosvarki imeni Ye. O. Patona AN UkrSSR (Institute of
Electric Welding AN UkrSSR)

SUBMITTED: 27Jun64

ENCL: 01

SUB CODE: MM

NO REF SOV: 010

OTHER: 006

Card 3/4

L 20103-65
ACCESSION NR: AP4045454

ENCLOSURE⁰¹

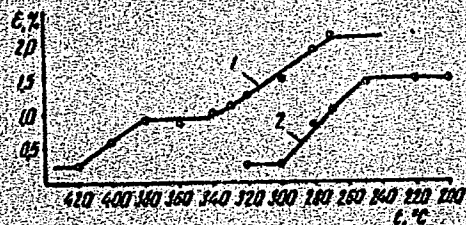


fig. 1

Plastic deformation under the action of stress application according to the type of joints with (1) an austenitic weld and (2) a ferritic-pearlitic weld

Card 4/4

MOSENDZ, N.A.; MAKARA, A.M.

Effect of the composition of flux on the content of sulfur +
oxygen in the seam metal. Avtom.svar. 18 no.1:38-42 Ja 1961.

(MIRA 18.1)

1. Institut elektrosvarki im. Ye.O.Patona AN UkrSSR.

MAKARA, A.M.; ISKRA, A.S.; YEGOROVA, S.V.; YUNGER, S.V.; GORKUNENKO, N.;
NIKUYKO, N.A.; ZANDBERG, S.A.; BRONSHTEYN, L.M.

Technology of electric slay welding of petroleum refining and
chemical apparatus without normalization. Avtom. svar. 18
no.5:11-16 My '65. (MIRA 12:6)

1. Institut elektrosvarki im. Ye.G. Patona AN UkrSSR (for Makara,
Iskra, Yegorova). 2. VFTKhimnefteapparatury (for Yunger,
Gorkunenko, Nikuyko). 3. Volgogradskiy zavod im. G. Zandberg,
Bronshteyn.

L 24457-66 EWT(m)/EWP(v)/T/EWP(t)/EWP(k) IJP(c) JD/HM/IM/JG
 ACC NR: AP6012277 (N) SOURCE CODE: UR/0125/65/000/011/0005/0011

AUTHOR: Makara, A. M.; Dzykovich, I. Ya.; Mosendz, N. A.; Gordan', G. N.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki AN UkrSSR)

TITLE: Investigation of microscopic chemical heterogeneity in weld joints

SOURCE: Avtomaticeskaya svarka, no. 11, 1965, 5-11

TOPIC TAGS: welding, x ray analysis, alloy steel, weld evaluation, cooling rate, high strength steel, seam welding
 ABSTRACT: Localized x-ray analysis is used for studying the effect of cooling rate on the degree of chemical nonhomogeneity in welded seams of high-strength steel as a function of the content of basic alloying elements (silicon, manganese, chromium, nickel, molybdenum and tungsten) and also for determining the relationship between this nonhomogeneity and the concentration of carbon in the seam, as well as the content of carbon combined with alloying elements. Electroslag, electric arc and electron beam methods were used to give a wide range of cooling rates. Welded specimens of KhGSN, Kh2GSNVM and Kh3M were studied. It is shown that the degree of microscopic chemical heterogeneity in the joints remains nearly constant throughout a wide range of cooling rates and variations in acicular crystallite sizes. The degree of liquation of

UDC: 621.791.053 : 620.192.3

Cord 1/2

L 24457-66

ACC NR: AP6012277

8

elements in the weld seams is considerably dependent on carbon concentration, nature of the impurity element and the system used for alloying. The degree of molybdenum liquation increases rapidly with carbon concentration, tungsten shows somewhat less dependence, while the liquation of chromium, silicon, manganese, and nickel is affected only slightly by an increase in carbon content. Molybdenum and vanadium liquate out much more readily than chromium, silicon and manganese; nickel is not segregated in this manner at all in many cases. Further studies are needed on the development of chemical microheterogeneity in weld seams as a function of crystallization conditions, concentration and nature of impurity elements and alloying systems. Orig. art. has: 3 figures, 3 tables.

SUB CODE: 11,13/

SUBM DATE: 13Apr65/

ORIG REF: 008/

OTH REF: -002

Card 2/2 *dda*

L 07434-67 EWT(m)/EWP(t)/ETI IJP(c) JH/JD/HW
ACC NR: AP6030266 (N) SOURCE CODE: UR/0125/66/000/008/0006/0009 47
B

AUTHOR: Makara, A. M.; Dzykovich, I. Ya.; Gordan', G. N.; Mosendz, N. A.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki AN UkrSSR)

TITLE: Chemical micrononhomogeniety of cast alloys as a function of cooling rate

SOURCE: Avtomaticheskaya svarka, no. 8, 1966, 6-9

TOPIC TAGS: cast alloy, aluminum base alloy, copper base alloy, zinc containing alloy, nickel containing alloy, cooling rate, metal crystallization

ABSTRACT: Local x-ray spectral analysis is used for studying the effect of cooling rate on the degree of liquation of alloying elements in aluminum-zinc (15 wt.% Zn) and copper-nickel (15 wt.% Ni) alloys. The alloys were melted from 99.99% pure components in aluminum and steel crucibles 20 mm in diameter and 30 mm high. The difference in cooling rates was produced by using cold water, air or by furnace cooling. Some of the copper-nickel alloys were also poured into tapered water-cooled molds to obtain intermediate cooling rates. The cooling curves showed a pronounced inflection point corresponding as a rule to the equilibrium liquidus temperature. This temperature was taken as the end of crystallization on curves where this point was not fixed. The experimental data show that the degree of liquation of zinc in the Al-Zn alloys and of

Card 1/2

UDC: 621.791;620.192.4

L 07434-67

ACC NR: AP6030266

nickel in the Cu-Ni alloys increases sharply as the cooling rate is accelerated reaching a maximum at comparatively low cooling rates (about 1-3°C/sec) where it remains constant with a further increase in cooling rate. The development of chemical micro-nonhomogeneity (dendrite liquation) during crystallization changes the composition of interdendrite boundaries and the temperature range of alloy crystallization. This should have a corresponding effect on the technological properties of the alloy in this range. These data may be used for explaining the connection between the type of phase diagram and the resistance of the alloy to the formation of hot cracks. The composition of the dendrite axes in aluminum-zinc alloy is determined by the equilibrium solidus point and is independent of cooling rate over a wide range. Orig. art. has: 4 figures, 1 table.

SUB CODE: 11/ SUBM DATE: 16Mar66/ ORIG REF: 014/ OTH REF: 002

ms
Card 2/2

APPROVED FOR RELEASE: 06/20/2000

CIA-RDP86-00513R001031420009-1

SUMMARY

ABALAY, L., FRECKE, R., MAKARA, G., LOSYVARI, C., and KEMENY, I., of the Institute of Pathophysiology, Medical University, Budapest [Original version not given].

"Correlation between Adrenal Activity and Experimental Cardiopathy"

Budapest, Acta Physiologica Academiae Scientiarum Hungarica, Supplement to Vol 22, 1963; pp 13-14.

Abstract [Authors' English summary, modified]: The correlation between experimental cardiopathy and adrenal activity, the role of the adrenals in the genesis of the cardiac lesion produced by the cardiopathogenic diet has been investigated. Rats subjected to adrenalectomy and treated with prednisone developed grave liver lesion prior to the appearance of myocardial lesions in response to the cardiopathogenic diet. Chronic ACTH treatment caused aggravation of the cardiopathy and brought about hepatic lesions. The effects of the salt composition of the diet, increased protein, fat and vitamin E₂ intake were also investigated.

FRENKL, Robert; CSALAY, Laszlo; MAKARA, Gabor; SOMFAI, Zsuzsa; SHIMBOL, Laszlo;
Technikai asszisztens: OLTVANYI, Nenia

Effect of systematic muscular activity on the serotonin sensitivity in rats. Kiserl. orvostud. 16 no.4:391-393 Ag '64.

1. Budapesti Orvostudományi Egyetem Korelettani Intézete.

FELNAL, P. ; SALAY, J. ; WATSON, J. ; LAZAR, J.

and a summary of the results of the experiments conducted in the
study of the effects of the drug on the

activity of the enzyme, the activity of the
enzyme and the activity of the enzyme in the

L 1989-66

ACCESSION NR: AT5024298

HU/2505/64/025/002/0199/0202

AUTHOR: Frenkl, Robert; Csalay, Laszlo; Makara, Gabor, Somfai, Lauzsa

TITLE: Effect of regular muscle activity on the histamine sensitivity of the rat

SOURCE: Academia scientiarum hungaricae. Acta physiologica, v. 25, no. 2, 1964, 199-202

TOPIC TAGS: rat, muscle physiology, myology, animal physiology, biochemistry

ABSTRACT: Rats forced to swim regularly showed a decreased histamine sensitivity from the ninth day on. The decrease in the acid secretion by the stomach, observed in previous experiments to appear in the ninth week of regular swimming, may be due only in part to a change in histamine sensitivity. The change in the reaction of animals in training can not be considered to be due to a general change in systemic reactivity because the effect of carbaminoylecholine was the same in both groups. "The authors are gratefully indebted to Miss X. Oltvanyi for technical assistance." Orig. art. has: 4 graphs.

Card 1/2

L 1989-66

ACCESSION NR: AT5024298

ASSOCIATION: Institute of Pathophysiology, University Medical School, Budapest

SUBMITTED: 00

ENCL: 00

SUB CODE: LS

NR REF SOV: 000

OTHER: 008

JPRS

Card 2/2 *JP*

L 9764-66

ACC NR: AP6001957

SOURCE CODE: HU/0018/65/017/001/0074/0076

AUTHOR: Makara, Gabor; Frenkl, Robert; Csalay, Laszlo—Chalai, L.

ORG: Institute of Pathophysiology, Medical University of Budapest, Budapest
(Budapesti Orvostudományi Egyetem Korelettani Intézete)

TITLE: Correlation between the development of ulcer and histamine content of the gastric secretion in rats

SOURCE: Kiserletes Orvostudomány, v. 17, no. 1, 1965, 74-76

TOPIC TAGS: histamine, biologic secretion, biochemistry, endocrinology, pathology, gastroenterology, digestive system disease

ABSTRACT: In cases of anaphylactoid ulcer in rats, the histamine content and concentration of the gastric juice in stomachs with eroded walls is lower than in those with intact walls. The phenomenon may be caused by a rediffusion of the liberated histamine. Ildiko Sasvari served as technical assistant for this work. Orig. art. has: 2 figures. [JPRS]

SUB CODE: 06 / SUBM DATE: 24May64 / ORIG REF: 002 / OTH REF: 006

Card 1/1

MAKALA, T.; TOLLEY, J. J. J. Biol. Chem. 241: 1000-1002, 1966.

Effect of capsaicin on experimental ulcers in the rat. *Ann. Acad. Sci. Hung. Sci.* 13-16: 145, 1965.

1. Pathophysiological Institute, University Medical School, Budapest, and Research Institute of Experimental Medicine, Hungarian Academy of Sciences, Budapest. Submitted January 16, 1966.

MANUSCRIPT BY DAY L. FRANKLIN, LONDON, ENGLAND

The present work is a study of the physical properties of the
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1. The present work is a study of the physical properties of the
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HUNGARY

PAPP, Miklos, Dr; MAKARA, Gabor, Dr; VARGA, Bertalan, Dr; Hungarian Academy of Sciences, Experimental Research Institute of Medicine (director: FUSZNYAK, Istvan, Dr) (Magyar Tudomanyos Akademia, Kiserleti Orvostudomanyi Kutato Intezet), Budapest.

"Effect of Bradykinin, Kallidin, Serotonin and Histamine on Pancreatic Blood Flow."

Budapest, Orvosi Hetilap, Vol 107, No 37, 11 Sep 66, pages 1745-1747.

Abstract: [Authors' Hungarian summary] The inflammation-producing compounds bradykinin and kallidin as well as serotonin, when injected into the pancreatic arteries even in small amounts, will increase the pancreatic blood flow in dogs. The injection of larger amounts of bradykin, kallidin and histamine into the thoracic aorta produces the same effect. All 20 references are Western.

2/1

L 43639-66 RC

ACC NR:

876322/4

SOURCE CODE: HU/2505/65/027/001/0021/0025

APPROVED FOR RELEASE: 06/20/2000

CIA-RDP86-00513R001031420009-1

AUTHOR: Makara, Gabor; Csalay, Laszlo; Frenkl, Robert; Somfai, Zsuzsa

ORG: Institute of Medical Research, MTA, Budapest (MTA Kiserleti Orvostudomanyi Kutato Intezet); Institute of Pathophysiology, Medical University of Budapest, Budapest (Budapesti Orvostudomanyi Egyetem, Korelettani Intezet)

TITLE: Effects of serotonin following desensitization with capsaicin

SOURCE: Academia scientiarum hungaricae. Acta physiologica, v. 27, no. 1, 1965, 21-25

TOPIC TAGS: serotonin, body temperature, pharmacology

ABSTRACT: On desensitization with capsaicin, the body temperature-lowering, anti-diuretic and local edematogenous actions of a low dose of serotonin are diminished while the temperature-lowering and ulcerogenic effects of a high dose of it remain unchanged. Orig. art. has: 5 figures. [Orig. art. in Eng.] [JPRS]

SUB CODE: 06 / SUBM DATE: 15Nov63 / ORIG REF: 002 / OTH REF: 010

MAKARA, Gyorgy, dr., csoportvezeto-foorvos

Is gesarol detrimental to the human organism? Elet tud 18
no.43:1366 27 0 '63.

1. Budapesti Fovarosi Kozegeszsegugyi-Jarvanyugyi Allomas.

MAKARAYTIS, B.B. Cand Agr Sci -- (diss) "^{Problems} ~~Questions of agrotechnology~~ agr engineering
of field crops on sandy soils of the south-eastern part of Lithuania.
(According to data of the Varena ^{experimental} ~~Experimental~~ Station)"
Kaunas, 1957. 19 p. 13 cm. (Ministry Agr USSR. Lithuanian Agr Acad.)
150 copies. (KL, 23-57, 115)

SECRET
E. B.

USCIB/Customs - [illegible]

1. Subject : [illegible]

2. Source : [illegible]

3. Title : [illegible]

4. Date : [illegible]

Abstract : [illegible]

SECRET

MAKARCHENKO, A. F.

Acting Minister, Min. Public Health, Ukrainian SSR, -cl948-.

Public Health.

"Initial Results of the Union of Factory Dispensaries and Polyclinics in the Ukraine,"

SO: Sov. Med., No. 5, 1948.

MAKARCHENKO, A. F.

Nerves

Serological characteristic of antigenic properties of nerve tissue.
Medych. zhur. 20, No. 6, 1951.

9. Monthly List of Russian Accessions, Library of Congress, August 1952. UNCLASSIFIED.

MAKARCHENKO, A.F.

Effect of manganese on the higher nervous function in dogs.
Vopr.fiziol. no.9:33-51 '54. (MIRA 14:1)

1. Ukrainskiy psikhonevrologicheskiy institut g. Khar'kov.
(MANGANESE, effects,
on higher nervous funct. in dogs)
(CENTRAL NERVOUS SYSTEM, effect of drugs on
manganese, higher nervous funct. changes
in dogs.)

1. The first part of the report is a summary of the work done during the period covered by the report.

2. The second part of the report is a detailed description of the work done during the period covered by the report. This part includes a description of the methods used, the results obtained, and a discussion of the significance of the results.

3. The third part of the report is a conclusion and a list of references.

MAKARCHENKO, A.F.

Changes in the nervous system in manganese poisoning. Vop. fiziol.
no.10:26-43 '54 (MLRA 10:5)

1. Institut fiziologii im. A.A. Bogomol'tsa Akademii nauk USSR.
(MANGANESE--TOXICOLOGY) (NERVOUS SYSTEM--DISEASES)

MAKARCHENKO, O.F.

Sleep therapy for sequelae of manganese intoxication. Medych.
zhur.24 no.2:59-71 '54. (MLRA 8:10)

1. Ukrains'kiy psikhonevrologichniy institut.
(POISONING,
manganese, sleep ther.)
(SLEEP, therapeutic use,
manganese pois.)
(MANGANESE, poisoning,
ther.,sleep)

VOROB'YEV, A.M., professor, redaktor; GOREV, N.N., redaktor; KAVETSKIY, R.Ye., redaktor; MAKARCHENKO, A.F., professor, redaktor; PROTOPOPOV, V.P., redaktor; SIROFININ, M.N., professor, redaktor; FOL'BERT, G.V., redaktor; POLEVOY, S.V., redaktor; KRYLOVSKAYA, N.S., tekhnicheskii redaktor

[Higher nervous activity and cortical-visceral interrelations in normal and pathological states] Vysshaya nervnaya deiatel'nost' i kortiko-vistseral'nye vzaimootnosheniya v norme i patologii. Kiev, Izd-vo Akademii nauk Ukrainnoi SSR, 1955. 271 p. (MLRA 9:2)

1. Akademiya nauk URSS. Kiev. Institut fiziologii. 2. Chlen-korrespondent AN URSS (for Vorob'yev, Sirotin) 3. Deystvitel'nyy chlen AMN SSSR (for Gorev) 4. Deystvitel'nyy chlen AN URSS (for Kavetskiy, Protopopov, Fol'berg) (NERVOUS SYSTEM)

MAKARCHENKO, O.P.; KOLCHINS'KA, A.Z.

At the Eighth Congress of the All-Union Society of Physiologists,
Biochemists, and Pharmacologists. Fiziol. zhur. (Ukr.) 1 no.3:
131-143 My-Je '55. (MLRA 9:9)
(PHYSIOLOGY--CONGRESSES)

MAKARCHENKO, A.F. (Kiyev)

Eighth Congress of the All-Union Society of Physiologists,
Biochemists, and Pharmacologists. Zhur.vyssh.nevr. deiat.

5 no.4:600-608 J1-Ag '55

(MLRA 8:11)

(PHYSIOLOGY--SOCIETIES)

MAKARCHENKO, O.F.

For further creative development of physiology in the Ukraine.
Visnyk AN URSS 26 no. 3-9 My '55. (MIRA 8:8)
(Ukraine--physiology)

~~MAKARCHENKO, Aleksandr Fedorovich~~, professor; POL'BORT, G.V., professor,
akademik, otvetstvennyy redaktor; SNEZHIN, M.I., redaktor
izdatel'stva; RAKHLINA, N.P., tekhnicheskiy redaktor

[Modifications of the nervous system in manganese poisoning] Izme-
neniia nervnoi sistemy pri intoksikatsii margantsom. Kiev, Izd-vo
Akademii nauk USSR, 1956. 317 p. (MLRA 9:10)

1. Akademiya nauk USSR (for Pol'bort)
(MANGANESE--TOXICOLOGY) (NERVOUS SYSTEM--DISEASES)

BOGOMOLETS, Aleksandr Aleksandrovich, akademik, Geroy Sotsialisticheskogo Truda; GOREV, N.N., redaktor; KAVETSKIY, R.Ye., otvetstvennyy redaktor; MAKARCHENKO, A.F., professor, redaktor; MEDVEDEVA, N.B., redaktor; SIROVININ, N.N., redaktor; SNEZHIN, M.I., redaktor izdatel'stva; RAKHLINA, N.P., tekhnicheskiy redaktor

[Selected works in three volumes] Izbrannye trudy; v trekh tomakh. Kiev, Izd-vo Akademii nauk USSR. Vol. 1. 1956. 282 p. (MLRA 9:10)

1. Deystvitel'nyy chlen AMN SSSR (for Gorev) 2. Deystvitel'nyy chlen AN USSR (for Kavetskiy). 3. Chlen-korrespondent AN USSR (for Medvedeva, Sirotinin)
(PHYSIOLOGY, PATHOLOGICAL)

MAKARCHENKO, A.F.

changes in chronaxy caused by manganese intoxication. Fiziol.zhnr.
(Ukr.) 2 no.3:68-77 My-Je '56. (MIRA 9:10)

1. Institut fiziologii imeni O.O.Bogomol'tsya Akademii nauk URSR,
viddil klinichnoi ta yeksperimental'noi nevrologii.
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MAKARCHENKO, A.F.; GORBACH, N.L.

Bioelectrical activity of the cerebral cortex in infectious diseases
of the nervous system. Fiziol.zhur. [Ukr.] 2 no.5:26-34 S-O '56.
(MIRA 10:1)

1. Institut fiziologii imeni O.O.Bogomol'tsya Akademii nauk URSR.
(ELECTROPHYSIOLOGY) (CEREBRAL CORTEX)
(NERVOUS SYSTEM--DISEASES)

MAKARCHENKO, A.P.

A.M.Vorob'ev; obituary. Zhur.vys.nerv.delat. 6 no.1:182-183
Ja-F' 56. (MLRA 9:7)
(VOROB'EV, ANATOLII MARKOVICH, d.1955)

MAKARCHENKO A.F.

"Chemical Factors of Nervous Irritation in the Blood and Spinal Cord Fluid in Manganese Intoxication," by A. F. Makarchenko, VIII Vsesoyuznyy S'yezd Fiziologov, Biokhimikov, Farmakologov (VIII All-Union Session of Physiologists, Biochemists, and Pharmacologists), Moscow, 1955, 394-395, (from Sovetskoye Meditsinskoye Referativnoye Obozreniye, Normal'naya i Patologicheskaya Fiziologiya, Biokhimiya, Farmakologiya i Toksikologiya, No 27, 1956, abstract by F. Meyerson, p 125

"The author established that a sharp rise in the activity of acetylcholine in the blood occurred in patients with expressed symptoms of affection of the central nervous system (parkinsonism syndrome) caused by manganese intoxication. Fluctuations of the cholinesterase enzyme in most of the patients of this group were within the normal limits, and only in individual cases was there a rise in the activity of cholinesterase. In the initial stages of manganese intoxication the rise in acetylcholine activity was not intensely pronounced. Systematic investigation of the content of acetylcholine and cholinesterase in the blood of dogs during the first month of chronic manganese intoxication revealed a rise of acetylcholine content in the blood of only one dog out of 14 which were poisoned. Beginning with the third or fourth month of daily intoxication by manganese the quantity of acetylcholine in the blood began to rise while the activity of cholinesterase simultaneously began to decline. It is the author's opinion that manganese has a harmful effect on the cortex and subcortex and disturbs the metabolism of the mediators of nervous irritation." (U)

: MAKARCHENKO, A. F.

"Characteristic of Higher Nervous Activity in Manganese Intoxication [in the Clinic and in Experiments], by A. F. Makarchenko, Vyssshaya Nervnaya Deyatel'nost' i Kortiko-Vistseral'nyye Vzaimootnosheniya v Norme i Patologii (Higher Nervous Activity and Normal and Pathological Cortico-Visceral Relationships), Kiev, 1955, pp 47-55 (from Sovetskoye Meditsinskoye Referativnoye Obozreniye, Moscow, No 28, 1956, abstract by A. Gurvich. p 149)

"A characterization of the modifications of higher nervous activity caused by manganese intoxication based on the study of a clinical picture and on experiments on animals is provided in the work. The early symptoms of the affection of the nervous system caused by manganese intoxication are emphasized in the clinical picture. Symptoms of damage to the central and peripheral nervous systems were noted in parkinsonism, which is the basic syndrome of the intoxication. In many cases of manganese intoxication the study revealed characteristic changes in the electroencephalogram, the degree of the changes depending on the depth of the intoxication. The appearance of delta-type waves, slowly fluctuating between two to four per second, was observed. Various type changes of the alpha-rhythm, i.e., diminution or complete disappearance of alpha-waves, irregularity of alpha-rhythm, and the frequent reappearance of small groups of alpha-waves after a period of complete absense, were noted.

"In experiments on dogs, symptoms of disturbed conditioned reflex activity appeared at the early stage of the development of intoxication when disturbances in the somatic sphere [disruption of the inhibition and stimulation processes and prolongation of the latent period] had not as yet developed. The further development of intoxication was characterized by phase stages, which indicated a serious disruption of the cerebral cortex processes. An almost complete restoration of conditioned reflex activity in dogs was achieved by a rest from intoxication. The author came to the conclusion that, in the pathogenesis of manganese intoxication, the disruption of the inhibition and stimulation processes in the cerebral cortex and the development of diffuse inhibition [protective type] play an important role."

Summary

11/19/86 4:45 PM
CHAGOVETS, Vasiliiy Yuri'yevich; BABSKIY, Ye.B., akademik, otvetstvennyy redaktor; KAVETSKIY, R.Ye., akademik, redaktor; KOLPAKOV, Ye.V., professor, redaktor; ~~MAKARCHENKO, A.P.~~, redaktor; POL'BORT, Yu.V., akademik, redaktor; SHEZHIN, M.I., redaktor izdatel'stva; KOLOMIYCHUK, V.A., tekhnicheskiiy redaktor.

[Selected works; in one volume] Izbrannye trudy; v odnom tome.
Kiev, Izd-vo Akad.nauk USSR, 1957. 513 p. (MIRA 10:11)

1. Akademiya nauk USSR (for Babskiy, Kavetskiy, Pol'bort).
2. Chlen-korrespondent Akademii nauk USSR (for Makarchenko).
(Electrophysiology)